PCT/IL04/000868

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Ante/Post- dated

# בקשה לפטנט
# PATENT APPLICATION

אני, (שם המבקש, מענו - ולגבי גוף מאוגד - מקום התאגדותו)
I (Name and address of applicant, and, in case of body corporate, place of incorporation)

גדעון טחן מ.ז. 055048052
סרוויז'ן 513052324
רחוב הרטום 11
הר חוצבים
ירושלים

בעל אמצאה מכח שמה הוא:
Owner, by virtue of

of an invention, the title of which is:

(בעברית) חסכון משאבים בשרת דוחס מספר מקורות ווידאו.
(Hebrew)

(באנגלית) **Saving Resources On A Multiple Source Video Encoder**
(English)

מבקש בזאת כי ינתן לי עליה פטנט.
hereby apply for a patent to be granted to me in respect thereof.

| *בקשת חלוקה- Application for Division | *בקשת פטנט מוסף- Application for Patent of Addition | *דרישת דין קדימה Priority Claim | | |
|---|---|---|---|---|
| מבקשת פטנט from application | לבקשה/לפטנט to Patent/Appl. | מספר/סימן Number/Mark | תאריך Date | מדינת האיגוד Convention Country |
| No_____ מס' | No_____ מס' | | | |
| dated_____ מיום | dated_____ מיום | | | |

*יפוי כח: כללי/מיוחד - רצוף בזה / עוד יוגש
P.O.A.: general / specific - attached / to be filed later-

Has been filed in case_____ הוגש בענין

המען למסירת הודעות ומסמכים בישראל
Address for Service in Israel

רחוב הרטום 11

ת.ד. 45205
ירושלים 91450

היום 18 בחודש ספטמבר שנת 2003
This 18 Of September of the year 2003

חתימת המבקש
Signature of Applicant

SERVISION LTD.
513052324
JERUSALEM ISRAE

REFERENCE: סימוכין:

טופס זה, כשהוא מוטבע בחותם לשכת הפטנטים ומושלם במספר ובתאריך ההגשה, הינו אישור להגשת הבקשה שפרטיה רשומים לעיל

# SAVING RESOURCES ON MULTIPLE SOURCE VIDEO ENCODER SERVERS

## Introduction:

For a long time, for achieving a good Video Streaming, a large buffer was implemented to enable a quality stream without bandwidth fluctuations. Internet based players were always characterized as "wait much time to watch well at a short time".

This characteristic pushed the market on the development of high compression ratio (CR) schemes. As CR increases, the amount of data decreases, and so, the wait time decreases also.

So market achieved solutions that reduced the user "wait time", by using a high CR, without decreasing substantially video quality, using a large buffering.

On surveillance market, we have 2 basic needs:

1- High Quality Recording for individuals and/or occurs recognition. Playing of this media has no need of low delay from real time video.
2- Ultra Low Delay from Real time Video. This feature enables the policemen/ guardians/ soldiers to wait up to 2.5 seconds (under a cellular infrastructure environment) from real time video, giving them the possibility of reacting quickly.

Why to use cellular infrastructure?

1 -There is a need of media availability to support the real time video streaming. Since today, cellular shows a high availability it will be the media preferred to use.

2- Cellular Infrastructure is one of the narrowest bandwidth available today. By achieving performance we need, at 9-28kbps on cellular, we will expect higher performances on another media like PSTN/IDSN/ LAN, etc.

Bandwidth Fluctuation

At packed-based networks, bandwidth can change from high to low and/or vice-versa drastically. It can generate effects on streaming like "fast forward" (quick show of frames) or "slow motion"(slow show of frames)

As the compression Complexity increases, the processor's computing power (PCP) needed increases too. On an environment, where server is responsible to support many clients, and so, many and different video streams, PCP availability is critical.

**Field of Invention:** The invention will save the resources needed

**Prior Art:**

Actual Solutions use heavy computing power systems.

**What's the Problem?**

Main challenge compression is to execute it on a cost-effective way at a reasonable power, which means powerful processors and/or arrays of them. ASIC designs are not flexible to add new features. Standard are not 100% close and/or implemented, to enable a 100% design on an ASIC. So the preferred solution is a processor based one.

**Drawings:**

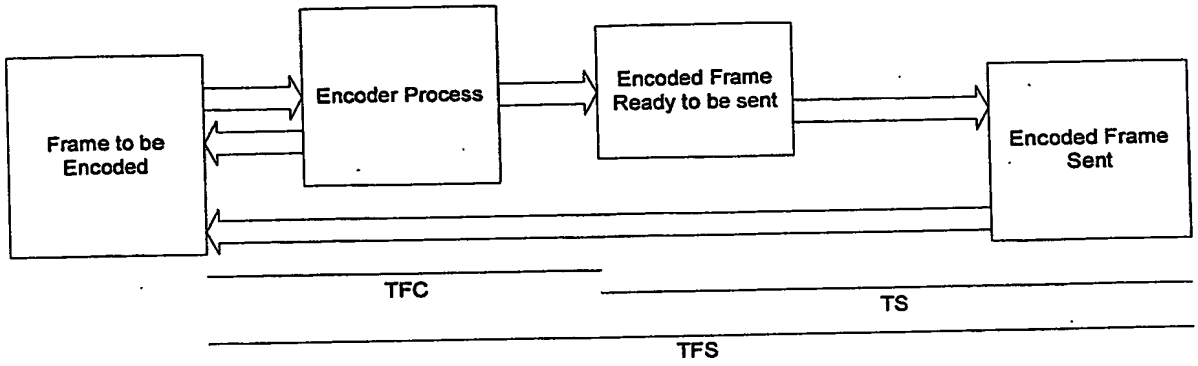
The Solution (Quality Streaming)

The solution is based on 3 basic parameters:

TIME_FRAME_COMPRESSION (TFC)- It is the time used for compression of one frame. It can be changed depending on encoder resources.

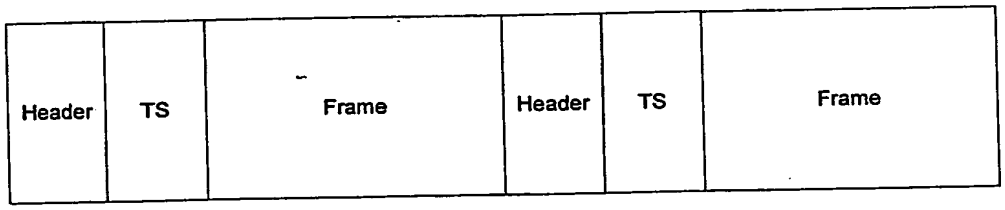
TIME_FRAME_TO_SEND (TFS)- It is the average time to send each frame, defined by the environment. On a 10 frames per second case (10fps), TFS = 1s/10 = 100ms

TIME_SLEEP (TS)- It is the time encoder "waits" to send. It is defined by TFS-TFC.




TS can be sent on the beginning of each frame. The total overhead on an IP packet would be less then 2% which is not critical.

At this way, by receiving TS, the decoder/receiver can "freeze"(remain to show the current frame) or "accelerate"(decrease the show time) independently from statistics from bandwidth (counting of bits received), or by using a communication channel with encoder that could be slow cause the TRT.




Servision's Video Streaming Format

The solution is basically located on the client site. The client will be responsible for buffering the data received. The buffer used has dynamical size.

**Advantages of the Invention over Prior Art:**

By compensating the resources on video server encoder on client, lower cost encoders can be done, increasing the potential of Video of Demand (VOD).

**Innovative Steps:**

Absence of resources on a video encoder server that normally can provide the requested performance can happen only, when the same server supports some clients with different streams.

This application enables the use of medium power computing systems for normal streaming, at the place of the use of high power computing systems that are good on peak situations, but overkill on most of the time.

**Glossary of Words and Acronyms:**

TRT-Time Round Trip- (TRT) – It is the time to send message and receive its feedback. It is large (1s by practical tests).

FIFO- Memory organized at the First In First Out format

Fps-frames per second

Kbps-kilobits per second

**References:**

**The MPEG-4 Book**, Fernando Pereira and Touradj Ebrahimi, ed. IMSC press, 2002.

## CLAIMS

1. A method for smoothly displaying the frames of a video stream, the method including the steps of:

assigning a header to each frame; and

allocating the sleep time for each frame prior to the time for frame compression, thereby controlling more effectively the resources of the processor encoder.

2. A method according to claim 1 further including the step of adjusting the size of the buffer in response to a dynamically varying bandwidth.

# Background Questions For The Inventor(s)

**(NEEDED TO FILL OUT THE REQUIRED FORMS)**

*The INVENTORS are defined as the individuals that provided a SOLUTION to a specific PROBLEM. It is preferable that the leading inventor will answer the questions.*

## I. General Questions About Inventors:

1) Who is/are the inventor(s)? For each inventor, give full name, work location, telephone number, email address, the date the inventor started to work at SERVISION (at least month and year), home address, home mailing address (if different), country of citizenship (or countries of citizenship, if there are more than one), and manager's name.

| **Name of Inventor** | 1) Dimitry Kratzov | 2) Gidon Tahan |
|---|---|---|
| **Work Location** | SerVision | SerVision |
| **Work Number** | | |
| **Work E-mail** | dimak@servision.net | gtahan@servision.net |
| **Start Date at SERVISION** | March 2002 | March 2000 |
| **Home & mailing address** | Rishon LeTzion | Klanimus Kalman<br>Jerusalem, Israel |
| **Country of Citizenship** | Israel | Israel |
| **Manager's** | Gidon Tahan | Gidon Tahan |

2) If there are more than one inventors, what did each inventor contribute to the invention?

Inventor 1: **Design and implementation**

Inventor 2: **Ideas and consulting.**

3) Are there inventors who do not work at SERVISION today? If so:

a) Who are they?

b) Where do they work now?

c) Did they at work at SERVISION at any time during the conception or implementation of the invention?

d) If so, what are the dates that they started and stopped working at SERVISION?

## II. History of the Invention:

*[The idea here is to let the Attorneys know how the idea developed and at what stage of development the idea is today. The questions below should be answered very briefly.]*

1) What is the current stage of the idea? Select one: Concept _____; Analysis ____; Design _____; Prototype _____; Bench Test/Alpha Test _____; Pilot Run/Beta Test _____**X**_____; Commercial Production _____.

2) Conception of the idea:

a) When did the inventors get the idea for the invention (approximately, if the exact date is not known)? **June 2000**

b) Where did this happen? **SerVision**

c) Where there any non-inventors present when the idea was created? **No**

d) If so, who?

3) First sketch or drawing: **August 2000**

a) When was the first sketch or drawing of the idea made? **SerVision**

b) Who made it? **Gideon Tahan**

c) If you have a copy of the first sketch or drawing, please attach it.

4) First model or prototype: **August 2000**

a) Was a model or prototype of the idea made? **Yes**

b) If so, when was the model or prototype completed? **April 2003**

c) If this is being done now, when do you expect to complete the model or prototype?

5) Alpha testing:

a) Was the idea alpha tested? **Yes**

a) Who performed the alpha test? **Dimitry Kratzov**

b) When was the idea alpha tested? **May 2003**

c) Apart from the inventors, who else was present during the alpha testing of the idea? **None**

d) Where was the idea alpha tested? **SerVision**

6) Beta testing (at a customer site or partner site):

a) Was the idea beta tested? **No**

e) Who performed the beta test?

f) When was the idea beta tested?

g) Apart from the inventors, who else was present during the beta testing of the idea?

h) Where was the idea beta tested?

7) Has the idea been produced commercially? If so, when, how many units were produced (approximately), by who (that is, who was the manufacturer), and for who (that is, who was the customer)? **No**

8) Does this invention impact the project you are working on? **Yes.** If so:

a) How does the invention impact on your project? **The invention enabled the system to show a low delay streaming without loosing Video quality.**

b) How would you categorize the amount of the impact on your project?

VITAL [ ] IMPORTANT [**X**], or HELPFUL [ ]

*(REMEMBER, A PATENT DOES NOT NEED TO BE AN INVENTION OF A TOTALLY NEW INDUSTRY. IT SIMPLY NEEDS TO BE SOMETHING NEW THAT HAS SOME TECHNICAL OR COMMERCIAL VALUE. SMALL OR MODERATE IMPROVEMENTS MAKE UP THE VAST MAJORITY OF ALL PATENTS, AND HIGHLY REGARDED BY SERVISION.*

*)*

c) Why did you pick that category for the impact on your project?

**Because this feature set our company, (Servision) as leader on Video Surveillance streaming.**

9) *Apart from any impact the invention may have on your project, does this invention impact the Company's technology in general? No. If so:*

c) Why did you pick that category for the impact on the Company's technology?

10) Prior Practice:

a) Was the invention practiced before in SERVISION? If so, describe the circumstances? **No**

b) Was the invention practiced before at some place other than elsewhere? If so, describe the circumstances? **No**

c) Have you seen this solution in writing in the professional media? **No**

d) Have you performed a patent search? **No** If so, did you find any patents that were relevant to the invention (even if they weren't exactly the same)? If so, what the numbers of those patents? (Attach copies of whatever relevant patents you have.) Even if you have not performed a patent search, have you seen this idea described in a different patent?

e) Have you seen a similar idea described anywhere else? **No** If so, under what circumstances? (That is, a competitor's product, an advertisement, a trade show, etc.)

f) Do you have regular access to trade magazines, technical articles? Do visit trade shows, or do you get trade show information from other people? **Yes**

**g)** Where did you get the idea? **At work**

## III. Contacts with Outside Parties:

1) Up to the date you fill out this form, did you or anyone else you know of ever discuss the idea of the invention or the invention itself with anyone outside of SERVISION? **No**. If so:

a) With whom outside of SERVISION?

b) When?

c) Where?

d) What were the circumstances? (Discussion of idea, or product demonstration, or market research, or testing, or joint development, or offer to sell, or sale, etc.)

e) Were samples supplied?

f) Were written drawings or diagrams supplied?

g) At the time of each such contact with an outside party, did SERVISION have a Non-Disclosure Agreement between SERVISION and the party? If so, do you have this Agreement or do you know who does have the Agreement? (If you have it, please attach a copy.)

2) Did you or anyone else at SERVISION make an oral or written offer to sell? If so, please describe this offer, including name of potential customer, price offered, result of the offer, etc. **No**

3) Do you or anyone you know of plan to discuss the idea of the invention or the invention itself with anyone outside of SERVISION within the next six (6) months? If so, what will be the circumstances of this discussion? (Again, include any planned discussion, demonstration, market research, testing, joint development, offer to sell, intent to sell, etc.) **No**

4) Up to the date you fill out this form, was the idea ever published publicly? **No.** Does the idea appear in any SERVISION promotional literature? Does the idea appear in any article or paper that was published? Was the idea ever presented at a trade show?

5) Up to the date you fill out this form, was there ever any other public announcement or other revelation of the idea of the invention or the invention itself? **No** If so, when and under what circumstances? (An article, a trade show, a meeting, etc.)

6) Do you know if anyone is planning any public announcement or other public revelation of the idea of the invention or the invention itself over the next six (6) months? **No** If so, when and under what circumstances?

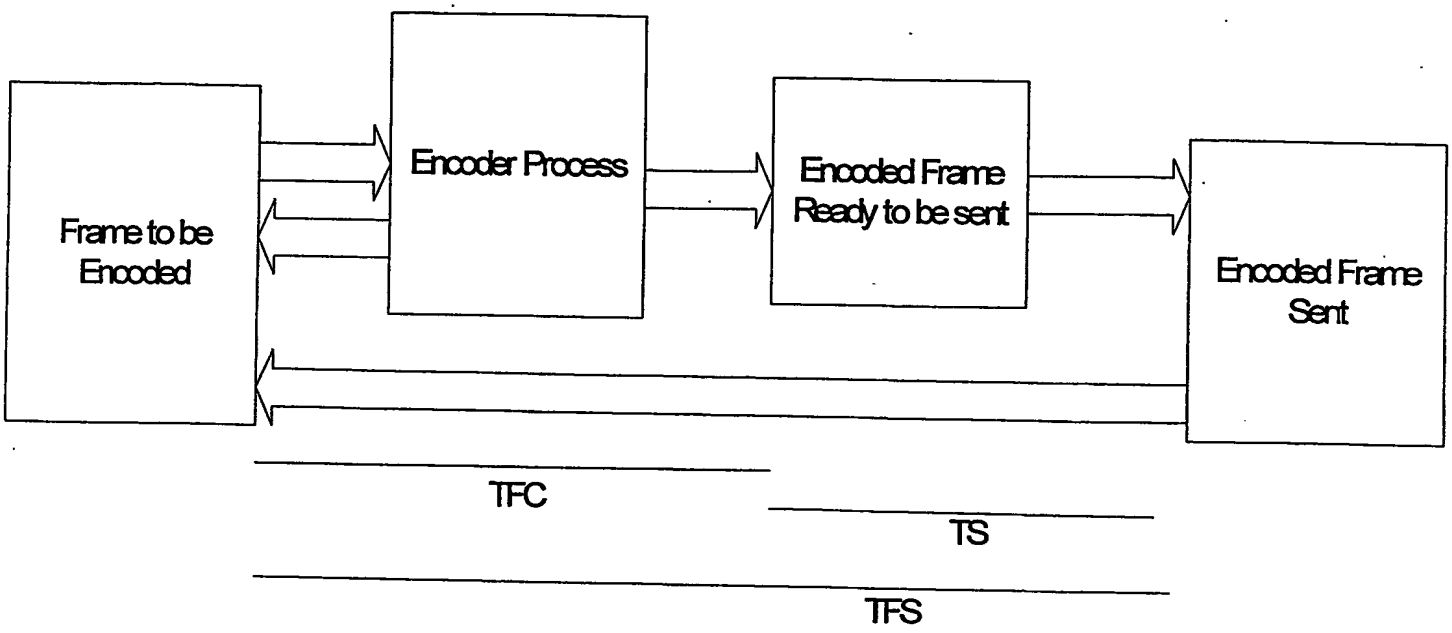



Figure 1- From encoding to Sending Process

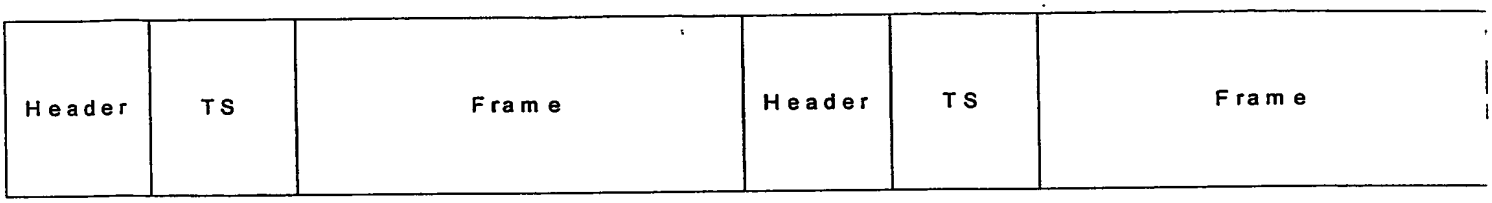



**Figure 2 –SerVision's Video Streaming Format**

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